What is claimed is:

1. A solder ball assembly comprising a mask having first and second sides and a plurality of holes formed therein, each hole having a first end opening onto the first side of the mask and a second end, a plurality of solder balls disposed in the holes, and a fixing agent securing the solder balls in the holes.

2. A solder ball assembly as claimed in claim 1 including a protective sheet attached to the first side of the mask and covering the first end of each of the holes.

3. A solder ball assembly as claimed in claim 1 wherein each solder ball protrudes from the first side of the mask.

4. A solder ball assembly as claimed in claim 1 wherein the fixing agent has a fluxing action.

5. A solder ball assembly as claimed in claim 1 wherein the fixing agent is at least one substance selected from the group consisting of rosin adhesives, polyethylene glycol adhesives, acrylic adhesives, rubber adhesives, polyester adhesives, polyvinyl acetate adhesives, and urethane adhesives.

6. A solder ball assembly as claimed in claim 2 including a parting agent disposed between the mask and the protective sheet.

7. A solder ball assembly as claimed in claim 1 including a protective sheet attached to the second side of the mask and covering the second end of each of the holes.

8. A solder ball assembly as claimed in claim 1 wherein each hole has a depth which is less than two times the diameter of the solder ball disposed in the hole.

9. A solder ball assembly as claimed in claim 1 wherein each hole has a diameter at its first end which is at least the diameter and less than two times the diameter of the solder ball disposed therein.

10. A solder ball assembly as claimed in claim 1 wherein each hole is tapered from its first end towards its second end.

11. A solder ball assembly as claimed in claim 1 wherein each hole is cylindrical.

12. A solder ball assembly as claimed in claim 1 wherein the second end of each hole is spaced from the second side of the mask.

13. A solder ball assembly as claimed in claim 1 wherein the second end of each hole extends to the second side of the mask.

14. A solder ball assembly as claimed in claim 1 wherein the mask comprises a material selected from the group consisting of photosensitive resin compositions, plastics, ceramics, paper, metal, and glass-epoxy composites.

15. A ball assembly comprising a mask having first and second sides and a plurality of holes formed therein, each hole having a first end opening onto the first side of the mask and a second end, a plurality of balls disposed in the holes, and a fixing agent securing the balls in the holes, the balls comprising a material selected

from metals, plastics, plated plastics, and ceramics.

16. A method of manufacturing a solder ball assembly comprising inserting a plurality of solder balls into holes formed in a mask, each hole having a first end opening onto a first side of the mask and a second end, each solder ball being inserted through the first end of a corresponding one of the holes, and fixing the solder balls in the holes with a fixing agent.

17. A method as claimed in claim 16 including applying suction to the second end of each hole while inserting the solder balls into the holes.

18. A method as claimed in claim 17 including placing the mask on a porous member and applying suction through the porous member.

19. A method as claimed in claim 16 including attaching a protective sheet to the first side of the mask to cover the first end of each of the holes after fixing the solder balls in the holes.

20. A method as claimed in claim 16 including placing a protective sheet coated with the fixing agent on the first side of the mask to cover the first end of each of the holes, and heating the protective sheet to make the fixing agent flow into the holes to fix the solder balls in the holes.

21. A method of forming solder bumps comprising placing the solder ball assembly of claim 1 on a substrate with each of the solder balls aligned with a corresponding electrode of the substrate, then heating the solder ball assembly to cause the fixing agent to release the solder balls from the mask, reflowing the solder balls to

form the solder balls into solder bumps atop the electrodes, and removing the mask from the substrate.